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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,494	12/17/2003	Richard Epworth	920476-95332	8123
23644 7590 02/23/2007 BARNES & THORNBURG LLP P.O. BOX 2786 CHICAGO, IL 60690-2786			EXAMINER FILE, ERIN M	
			ART UNIT 2611	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/23/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/738,494	EPWORTH ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Erin M. File	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 17 December 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-30 and 35-39 is/are rejected.
- 7) Claim(s) 24, 31-34 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 16 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All
  - b) Some \*
  - c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date: _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/17/2003</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION*****Drawings***

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the functions of the elements of figures 1-8 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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2. The drawings are objected to under 37 CFR 1.83(b) because they are incomplete. 37 CFR 1.83(b) reads as follows:

When the invention consists of an improvement on an old machine the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. Claims 1-35 recite a method, however, there are no drawings or figures enabling these claims.

5. Claim 39 is drawn to implementing a receiver control on a computer readable medium, however, the drawings do not appear to support such a configuration.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 25-28, 36-39 rejected under 35 U.S.C. 102(e) as being anticipated by Yajima et al. (U.S. Pub. No. 2004/0258410).

**Claims 1, 35, 36, 39, Yajima discloses:**

- receiving a signal from a transmission path (abstract, line 2, fig. 4, received data, [0010], line 5);
- generating a set of mutually related signals representing phase-shifted versions of the received signal by applying the received signal and a reference signal to a coupling network, the set of signals having a non-ideal coherence with respect to the reference signal (fig. 4, [0010], lines 3-10, although signals are not explicitly stated to be non-ideal, real world received signals are always assumed to be non-ideal, inherently meeting this limitation );
- processing the set of signals to determine which of the set of signals has a predetermined association with the reference signal (fig. 4, 42, [0010], lines 10-14);

- selecting, as an optimum output, at least one signal which meets the predetermined association (fig. 4, [0010] lines 14-16).

**Claim 2,** Yajima further discloses the step of processing the set of signals comprises determining which of the set of signals is most closely matched to the property of the reference signal ([0010], lines 10-14).

**Claim 3,** Yajima further discloses the property is phase and the step of processing the signals comprises determining which of the set of signals is most closely aligned to the phase of the reference signal ([0010], lines 3-16).

**Claim 25,** Yajima further discloses Yajima further discloses the set of input signals are derived from a single input signal, the set of signals representing phase-shifted versions of the single input signal (fig. 4, [0010], lines 3-16).

**Claim 26,** Yajima further discloses the set of input signals are electrical signals which have been derived from optical signals received by an optical front end to the receiver ([0006], lines 7-9).

**Claim 27,** Yajima further discloses the set of input signals are substantially equally spaced in phase, or phase and polarization ([0010], lines 3-10).

**Claim 28,** Yajima further discloses deriving clock timing for the processing from at least one of the set of signals ([0010], lines 17-19).

**Claim 37,** Yajima discloses:

- a first input port for receiving a signal from a transmission path (fig. 4, received signal);
- a second input port for receiving a reference signal (fig. 4, reference clock CL);

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- a coupling network which is operable to generate a set of mutually, related signals, the set of signals having a non-ideal coherence with respect to the reference signal (fig. 4, [0010], lines 3-10, although signals are not explicitly stated to be non-ideal, real world received signals are always assumed to be non-ideal, inherently meeting this limitation );
- a processing stage which is arranged to process the set of signals to determine which of the set of signals has a predetermined association with the reference signal; and, a selector which can select, as an optimum output, at least one signal which meets the predetermined association (fig. 4, 42, [0010], lines 10-16);

**Claim 38**, Yajima further discloses a communications network incorporating a receiver (fig. 4).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yajima et al. (U.S. Pub. No. 2004/0258410) as applied to claim 28 above, and further in view of Bar-David (U.S. Patent No. 5,237,287).

**Claim 4,** Yajima fails to disclose there is an in-phase datum representing the phase of the reference signal and an anti-phase datum where the step of processing the signals comprises determining which of the set of signals is most closely matched in phase to the in-phase datum or anti-phase datum, however, Bar-David discloses an in-phase datum representing the phase of the reference signal and an anti-phase datum where the step of processing the signals comprises determining which of the set of signals is most closely matched in phase to the in-phase datum or anti-phase datum (col. 5, line 5-col. 6, line 15). Because Bar-David discloses his method allows for robust signal detection (abstract, lines 18-19), it would have been obvious to one skilled in the art at the time of invention to incorporate the phase and anti-phase matching as disclosed by Bar-David into the invention of Yajima.

**Claim 5,** Bar-David further discloses if it is determined that the optimum signal is most closely matched to the 'anti-phase datum, the method further comprises the step of inverting the selected signal (col. 6, lines 6-7).

10. Claims 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yajima et al. (U.S. Pub. No. 2004/0258410) and Bar-David (U.S. Patent No. 5,237,287) as applied to claim 4 above, and further in view of Thesling et al. (U.S. 2002/0118737).

**Claim 6,** neither Yajima nor Bar-David disclose the step of determining which of the set of signals is most closely matched in phase to the in-phase datum or anti-phase datum comprises determining which of the set of input signals has the greatest amplitude, however, Thesling discloses determining which of the set of signals is most closely

matched in phase to the in-phase datum or anti-phase datum comprises determining which of the set of input signals has the greatest amplitude ([0035], lines 15-16).

Because Thesling discloses this selection has the advantage of reducing phase ambiguity ([0035]), it would have been obvious to one skilled in the art at the time of invention to incorporate the amplitude selection of Thesling into the combined invention of Yajima and Bar-David.

**Claim 7**, neither Yajima nor Bar-David disclose the step of determining which of the set of signals is most closely matched in phase to the in-phase datum or anti-phase datum comprises determining which of the set of input signals has the smallest amplitude and determining, from the mutual relationship of the set of signals, which of the remainder of the set of signals has the greatest amplitude, however, Thesling discloses the step of determining which of the set of signals is most closely matched in phase to the in-phase datum or anti-phase datum comprises determining which of the set of input signals has the smallest amplitude and determining, from the mutual relationship of the set of signals, which of the remainder of the set of signals has the greatest amplitude([0035], lines 15-16). Because Thesling discloses this selection has the advantage of reducing phase ambiguity ([0035]), it would have been obvious to one skilled in the art at the time of invention to incorporate the amplitude selection of Thesling into the combined invention of Yajima and Bar-David.

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11. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yajima et al. (U.S. Pub. No. 2004/0258410) as applied to claim 28 above, and further in view of Dunning et al. (U.S. Patent No. 6,606,360).

**Claim 29**, Yajima fails to disclose deriving clock timing for the processing from an average taken across all of the set of signals, however, Dunning discloses deriving clock timing for the processing from an average taken across a set of multiphase signals (abstract, lines 18-20). Because Dunning discloses this invention has the advantage of operating at high speeds without requiring costly analog circuitry, it would have been obvious to one skilled in the art at the time of invention to incorporate the averaging as disclosed by Dunning into the invention of Yajima.

**Claim 30**, Yajima fails to disclose making the step of selecting an optimum output in synchronism with a level change in the-input, however, Dunning discloses selecting an optimum output in synchronism with a level change in the-input (in fig. 5 Dunning discloses an edge buffer which outputs an edge trigger to the processing). Because Dunning discloses this invention has the advantage of operating at high speeds without requiring costly analog circuitry, it would have been obvious to one skilled in the art at the time of invention to incorporate the averaging as disclosed by Dunning into the invention of Yajima.

#### ***Claim Rejections - 35 USC § 112***

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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13. Claims 4-22, 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
14. In Claim 4, the recitation "an in-phase datum representing the phase of the reference signal and an anti-phase datum" is unclear and is rendered indefinite.
15. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the claim fails to describe how the selection of an optimum output is made synchronous with a level change in the input.

***Allowable Subject Matter***

16. Claims 8-23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
17. Claims 24, 31-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin M. File whose telephone number is (571)272-6040. The examiner can normally be reached on M-F 1:00PM-9:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached o. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Erin M. File

EF

2/14/2007

*David C. Payne*  
DAVID C. PAYNE  
PRIMARY PATENT EXAMINER